

STUDIES OF NEOTROPICAL LEAFHOPPERS. II. (HOMOPTERA: CICADELLIDAE)

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ABSTRACT—This paper updates our knowledge of American tropical leafhoppers in three subfamilies. The genera *Synogonia* Melichar and *Tahura* Melichar are transferred from the Cicadellinae to the Nirvaninae, a key is provided for their separation, and **fowleri** new species from Peru is designated as the type-species of *Tahura*. *Ichthyobelus youngi* from Colombia and *Pseudophera heveli* from Costa Rica are described as new Cicadellinae, Proconiini. In the subfamily Agalliinae, five new species are described from Peru: *Agalliopsis coluber*, *Agalliopsis moesta*, *Agalliopsis talpa*, *Euragallia prion*, and *Agallia kosmetron*.

The purpose of this series of papers is to supplement and update our knowledge of the Neotropical leafhoppers. Included in this paper are additions to the subfamilies Nirvaninae, Cicadellinae, and Agalliinae.

Subfamily NIRVANINAE

Kramer (1964) presented a key and described the genera of this subfamily and later added two additional monobasic genera (1965). Study of two genera, *Tahura* and *Synogonia*, described by Melichar and assigned to the Cicadellinae (=Tettigellinae) shows that their proper placement is in the Nirvaninae. Both will trace to couplet 4, *Jassosqualus* Kramer in my previous key. All three genera can be separated by the following key.

1. Coronal suture elevated as distinct longitudinal carina; crown and thoracic dorsum smooth and polished with few scattered minute punctures (Fowler, 1900: pl. 19, fig. 28) *Synogonia* Melichar
- Coronal suture not elevated; crown and thoracic dorsum finely rugulose or rugulose punctate 2
2. Forewing with a long "tail" (fig. 1); transocular width of head equal to or more than greatest pronotal width (fig. 1) *Tahura* Melichar
- Forewing normal; transocular width of head less than greatest pronotal width (Kramer, 1964: fig. 26) *Jassosqualus* Kramer

Synogonia Melichar 1926:344

Type-species: *Tettigonia nasuta* Fowler; China, 1938:134.

This genus is close to and differs from *Jassosqualus* Kramer (1964: 122) by the following characters: entire dorsum, especially crown and pronotum, highly polished and strongly shiny; coronal suture distinctly

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elevated; weak irregular carina sublaterally along coronal margins from ocellus to near apex. Male unknown.

Synogonia nasuta (Fowler)

Tettigonia nasuta Fowler, 1900:291, pl. 19, fig. 28.

Synogonia nasuta (Fowler); China, 1938:184.

Length of female 5.5 mm.

Structure: Antennae about as long as head; coronal surface with few minute scattered punctures, finely rugulose near eyes; surface of face finely granular or scaly with vague parallel ridges laterally on clypeus; pronotum with finely scattered punctures, most numerous in basal discal portion, and faint transverse rugulae; scutellum faintly and irregularly rugulose; forewing with most of clavus and adjacent portions of corium, coriaceous, and more or less irregularly punctate rugulose, rest of forewing somewhat thickened but not coriaceous.

Coloration: Venter of abdomen and legs stramineous to pale brown, female pygofer black or fuscus, last segment of hind tarsus infuscated; thoracic venter with same ground color, lateral edges fuscus or black; face black except for yellowish lower portions of genae, lora, and clypellus; crown, pronotum, and scutellum entirely black; forewing fuscus or black with yellow subtriangular patch followed by pale spot on clavus, costal margin in area near base of apical cells anteriorly to point in line with middle of clavus, yellowish white and marked with 2 fuscus or black transverse slightly oblique stripes.

Male genitalia: Male unknown.

Female genitalia: Posterior margin of pregenital sternum tapering to acute tooth.

Notes: The type, discussed by Young, 1965:185, is a specimen without an abdomen from Vera Paz, Guatemala, in the British Museum (Natural History). The only other known specimen is a female from Punta Gorda, British Honduras, February 1931, White in the USNM. The colored habitus illustration published with the original description (Fowler, 1900: pl. 19, fig. 28) shows the general markings well.

Tahura Melichar 1926:343

Type-species: *Tahura fowleri* Kramer, new species.

Form elongate and slender; crown strongly produced beyond eyes, median length greater than interocular width; in dorsal view, lateral coronal margins carinate, converging distally to narrowly or sharply rounded apex, coronal surface irregularly rugulose, ocelli on disc anterior to eyes, near coronal margins, head and pronotal widths subequal; crown in lateral view marginally carinate, carinate coronal margin straight, ending at or near anterior margin of eye, antennal base in deep depression in front of eye with oblique carinate ledge dorsally; in facial view, clypeus narrowing downward with sides rounded, short carina at apex of clypeus, lora slender; pronotum laterally carinate; forewing with venation rather obscure, 4 apical and 2 preapical cells, surface of forewing at least in part coriaceous with taillike extension at apex. *Male genitalia*: Pygofer with macrosetae distally in apical portion; plates long, exceeding pygofer, with macrosetae on inner

submargin and hairlike filaments on distal margins, plates divided and appearing 2-segmented; valve poorly developed; connective subcruciform; style elongate with apical lobes well developed; aedeagus elongated, basal portion prolonged and hinged to connective, apical portion of shaft upturned with gonopore subapical on ventral margin, dorsal apodeme rigid and stout.

Tahura fowleri Kramer, new species

fig. 1-4

Length of male 5.4 mm, of females 5.5-5.6 mm.

Structure: Antennae moderately long, about as long as head (fig. 1); coronal surface entirely rugulose; head in lateral view with narrower submarginal carina below carinate lateral coronal margin, submarginal carina gradually upturning at each end, distally usually touching or fading near extreme coronal apex, basally usually touching or fading on margin in line with anterior edge of ocellus; extreme coronal apex below margin shiny; face with clypeal surface finely granular or scaly, lateral edges of lora elevated above genae, lower edges of genae at least partially obliquely wrinkled, rest of lower face finely rugulose to smooth, pronotum transversely rugulose with scattered fine punctures; scutellum rugulose with some scattered fine punctures; forewing with clavus, except apex, and adjacent portion of corium, coriaceous, finely rugulose and/or punctate; rest of forewing somewhat thickened, not coriaceous, area of inner apical cells often convex, extension slender and long.

Coloration: Venter of abdomen yellow or yellowish brown with segments variably blackened; pygofer of female entirely black or fuscus; thoracic venter black or fuscus; legs yellow or yellowish brown with apex of hind tibia and terminal tarsal segment fuscus; face black with antennae pale; crown, pronotum, and scutellum black (fig. 1) only paler at coronal edges; forewing largely black on basal $\frac{2}{3}$, claval commissure narrowly yellow, pale subapical patch on clavus, usually extending to adjacent portion of corium, orange-brown patch on basal portion of apical cells and distal portion of preapical cells; apical portion of wing largely black or fuscus; extension of forewing pale on lateral portion; costal area yellowish white, broad distally and narrowing basally, marked with 2 black or fuscus transverse or slightly oblique stripes in distal half.

Male genitalia: Aedeagus in lateral view (fig. 3) with pair of slightly upturned sharp processes arising from ventral margin near apex; in dorsal view (fig. 2) connective convex in basal half, stalklike distally; style with mesal lobe long, sharp, curved laterad, lateral lobe broad and subquadrately produced; plates divided in basal half (fig. 4).

Female genitalia: Posterior margin of pregenital sternum (fig. 1) bilobed, notched at middle, central portion of segment subcarinate.

Types: Holotype male and allotype female Callanga, Peru, in collection of Hungarian Natural History Museum; paratype female Sinchono, Peru, in DeLong Collection at Ohio State University; paratype female Giraldo, Antioquia, Colombia, 29 August 1973, E. Urueta, on *Passiflora* sp. in USNM.

Notes: *Tahura* was described (Melichar, 1926:343) without included species. The holo- and allotype described by me represent

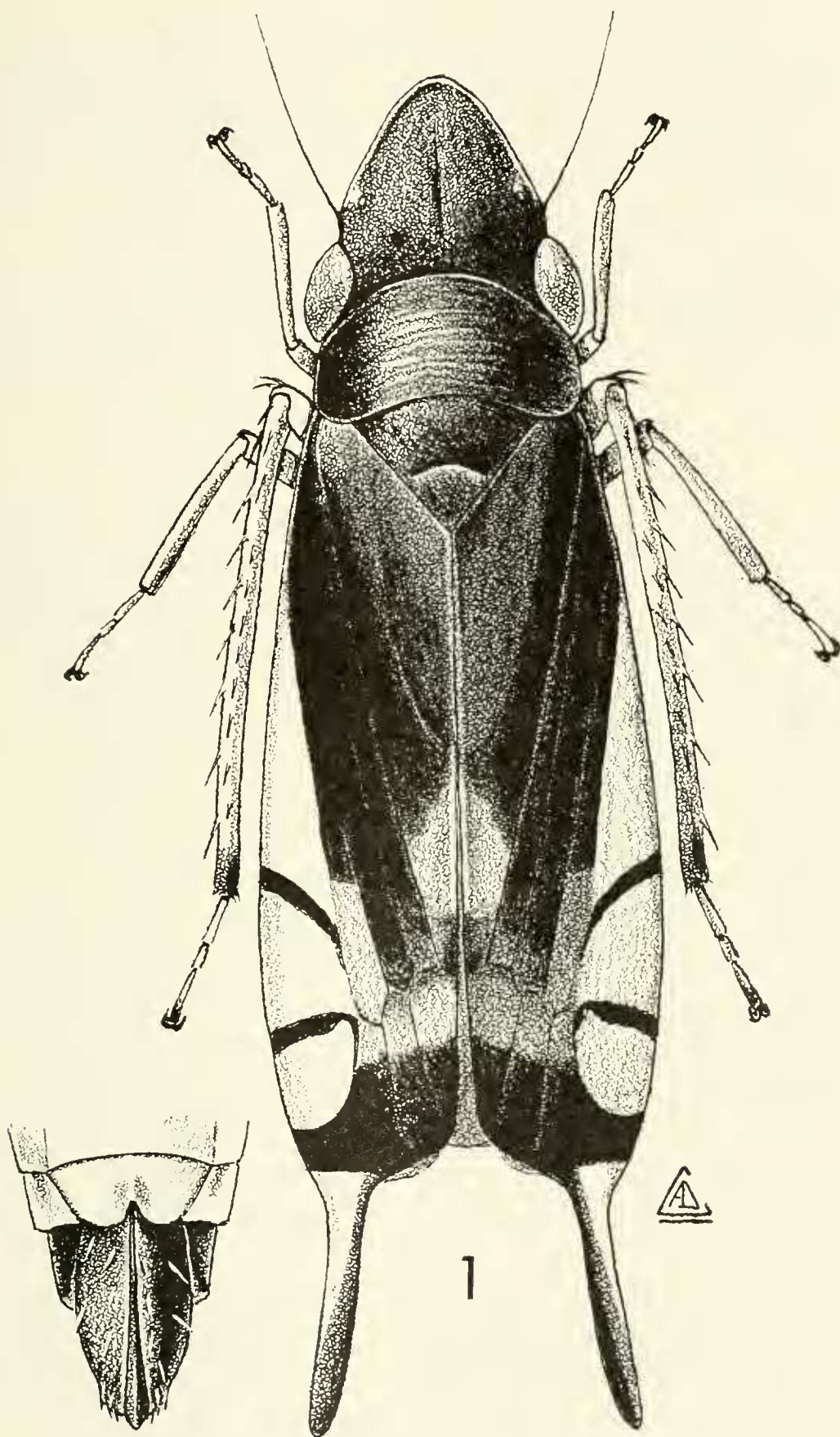


Fig. 1. *Tahura fowleri*. At left, female genital segments.

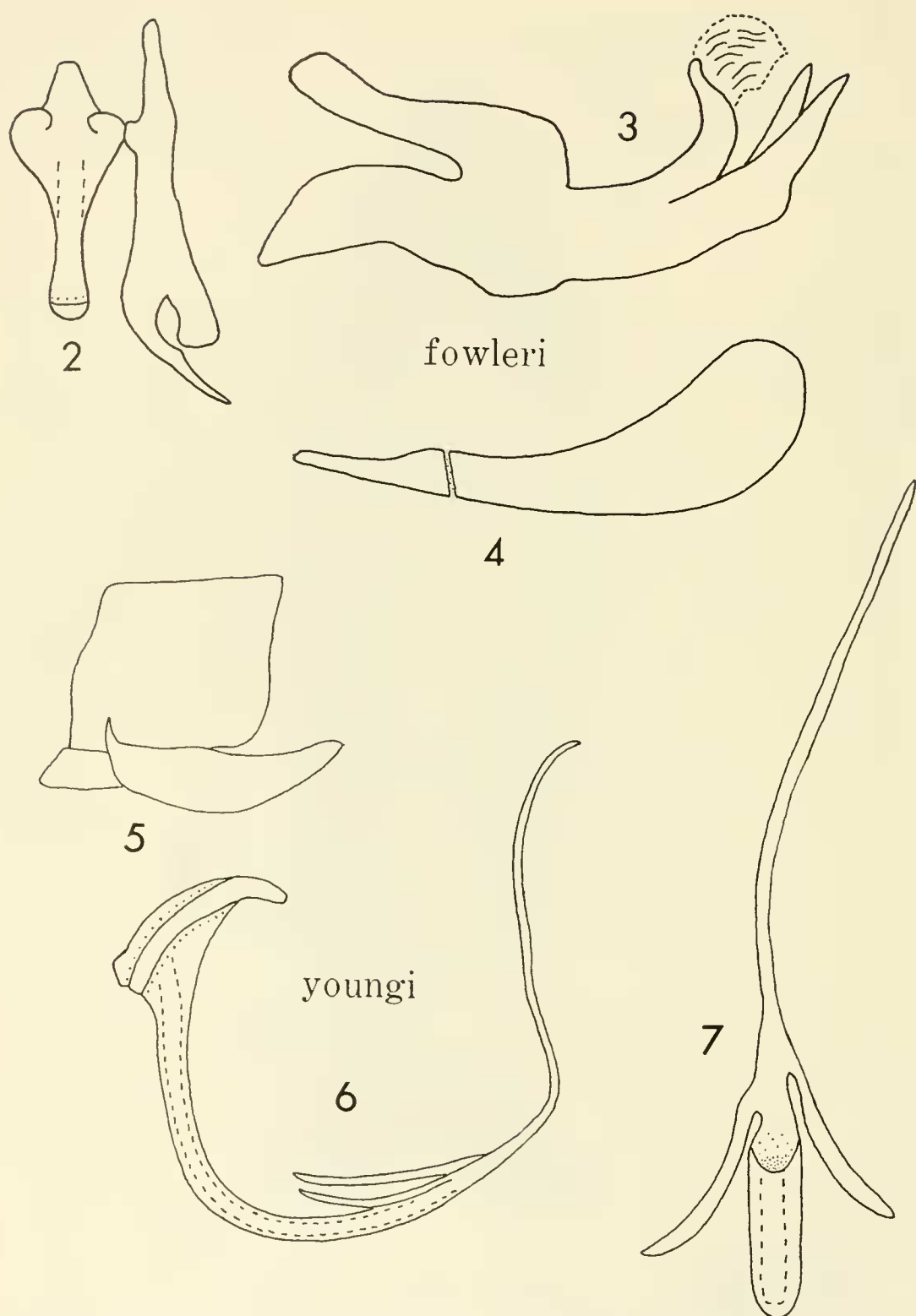


Fig. 2-4. *Tahura fowleri*. 2, Connective and style in dorsal view. 3, Aedeagus in lateral view. 4, Male plate in lateral view. Fig. 5-7. *Ichthyobelus youngi*. 5, Genital capsule in lateral view. 6, Aedeagus in lateral view. 7, distal portion of aedeagus in posterior view.

specimens of the species studied by Melichar and intended as his type-species. I am most grateful to Dr. A. Soos of the Hungarian Natural History Museum, Budapest, Hungary, for allowing me to study these specimens. The species is named for Rev. W. W. Fowler, the author of the leafhopper portion of the famed *Biologia Centrali-Americana*.

Subfamily CICADELLINAE, Tribe PROCONIINI

Young (1968) published a splendid revision of the Proconiini and established the first firm foundation for a classification of this tribe of New World leafhoppers. The Proconiini contains the largest and most robust leafhoppers found in the Americas.

Ichthyobelus youngi Kramer, new species

fig. 5-7

Length of male slightly more than 14 mm.

Structure: Typical of genus in all respects. Head with anterior process spoon-shaped and like that of *I. platyrrhinus* Young (Young, 1968, fig. 128a).

Coloration: Face, thoracic venter, legs, and abdomen drab and variably washed with purplish; central portion of clypeus irregularly blackened. Ground color of dorsum olive drab; edges and central portion of anterior process and areas on coronal disc dark purplish to black; pronotum with 2 narrow transverse dark purplish bands, anterior band narrowest at middle, posterior band produced cephalad at middle; scutellum dark with 2 transverse but incomplete olive drab bands on middle portion; forewing olive drab with veins mostly dark purplish, with 4 irregular dark purplish transverse bands, 1st band near wing base inconspicuous and incomplete, 2nd band narrow, 3rd and 4th bands comparatively broad, 3rd band bisects clavus, 4th band transects claval apex; preapical cells mottled with dark purplish, sparse mottling also in cells between 3rd and 4th bands.

Male genitalia: Setosity typical of genus; pygofer with hind margin broad and subtruncate (fig. 5); aedeagus in lateral view (fig. 6) with shaft slender and distal portion extended dorsally as narrow flagellum, with pair of slender basally projecting processes near base of flagellum; aedeagus in posterior view (fig. 7) with gonopore near base of asymmetrical processes; connective and style similar to that of *I. regularis* Young (Young, 1968, fig. 129e), but apex of connective not expanded and mesal lobe of style stouter and straighter on inner margin.

Type: Holotype male (USNM 73276) Leticia, Amazonas, Colombia, 1-3 Feb. 1969, R. Deitz. Leticia is the southernmost point in Colombia.

Notes: In Young's revision (1968:137) this species keys to *I. nasutus* Young. *Ichthyobelus youngi* differs from this species and all its congeners by the broad subtruncate hind margin of the pygofer and by the long terminal aedeagal flagellum. The species is named for Professor David A. Young in recognition of his masterful revision of the Proconiini.

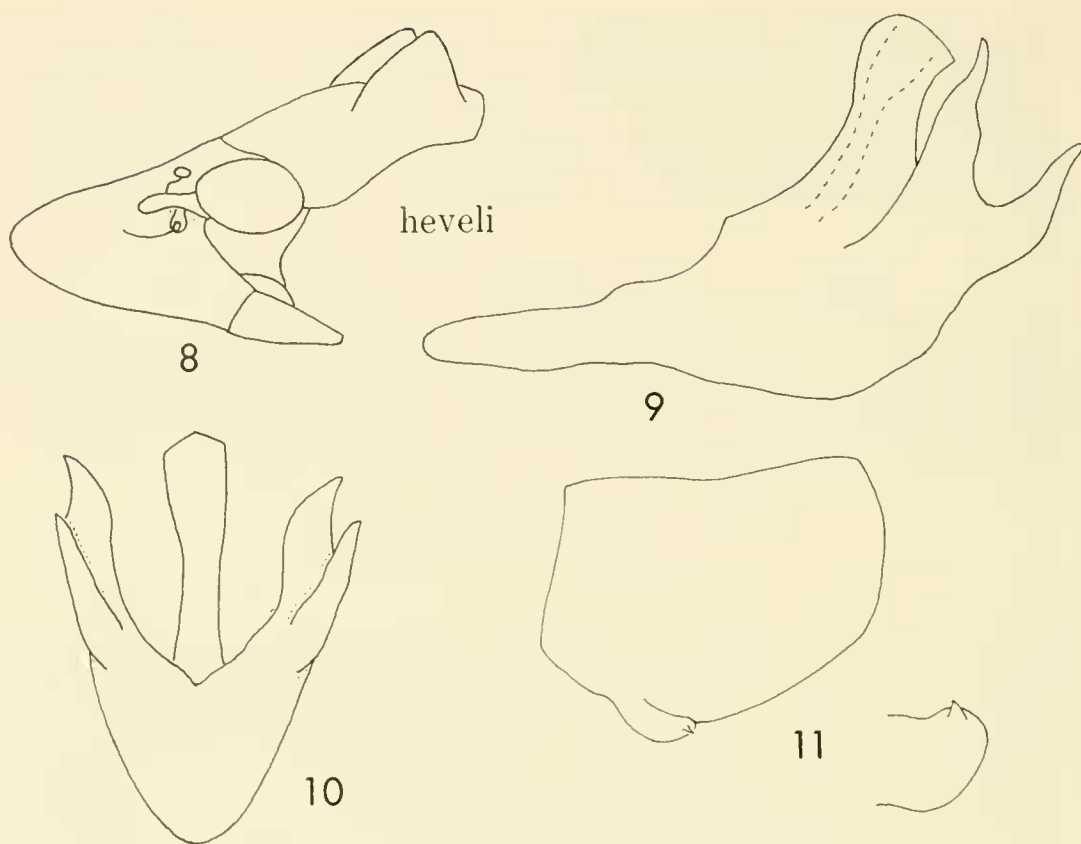


Fig. 8-11. *Pseudophera heveli*. 8, Head and pronotum in lateral view. 9, Aedeagus in lateral view. 10, Aedeagus in posterior view. 11, Pygofer in lateral view, at lower right pygofer process in ventral view.

Pseudophera heveli Kramer, new species

fig. 8-11

Length of male 19 mm.

Structure: Typical of the genus in all respects but with broad hornlike projections near posterior angles of pronotum (fig. 8).

Coloration: Head, thorax, legs, and abdomen deep dark red; tarsi, thoracic venter, and abdomen variably infuscated; forewings with veins deep dark red and most cells translucent dark blue, apical cells transparent smoky brown.

Male genitalia: Setosity typical of genus; pygofer with blunt lobe on ventral margin in proximal half (fig. 11); aedeagus stout but weakly sclerotized, in lateral view (fig. 9) with broad forked ventral paired processes extending dorsally to near aedeagal apex, in posterior view (fig. 10) aedeagus broadest distally with proximal fork of each process curved laterally and distal fork of each process fairly straight.

Type: Holotype male (USNM 73277) Puntarenas Monteverde area, Costa Rica, 6-14 June 1973, Gary F. Hevel.

Notes: In Young's revision (1968:210) this species keys to *P. heterogena* Schmidt. *Pseudophera heveli* differs from this species and all its congeners by the obvious pronotal projections which were previ-

ously unknown in species of the genus *Pseudophera*. The species is named for the collector.

Subfamily AGALLIINAE

Kramer (1964) published a key to the New World genera of this subfamily, added new species from both the Nearctic and Neotropical Regions, and updated previous checklists of species in all of the genera. The list below is an updating of the species from the Americas described since then.

- Agallia kosmetron* Kramer, n. sp. (Peru)
- Agallia pumila* Oman, 1971:326 (Oregon)
- Agallia sagittifer* Linnavuori, 1968:149 (Colombia)
- Agalliopsis abietaria* Oman, 1970:27 (Oregon)
- Agalliopsis ancistra* Oman, 1970:23 (Vermont)
- Agalliopsis coluber* Kramer, n. sp. (Peru)
- Agalliopsis hamatilis* Oman, 1970:16 (Mexico)
- Agalliopsis moesta* Kramer, n. sp. (Peru)
- Agalliopsis sonorensis* Oman, 1970a:32 (Mexico)
- Agalliopsis stella* Oman, 1970:21 (Texas)
- Agalliopsis talpa* Kramer, n. sp. (Peru)
- Euragallia prion* Kramer, n. sp. (Peru)
- Euragallia striata* Linnavuori, 1968:149 (Colombia)

Agalliopsis moesta Kramer, new species fig. 12-15

Length of male and female 4.2 mm.

Coloration: Entire venter fuscus to black; legs sordid stramineous, hind leg embrowned; face with lower half black (fig. 15), upper half pale orange brown with black band between eyes and 3 black spots at coronal margin, central coronal spot joined to band. In dorsal view (fig. 14) crown with 5 black spots, central 3 extensions of those visible in facial aspect; both pronotum and scutellum black anteriorly and whitish posteriorly; forewing translucent brown to reddish brown with pale spot on clavus adjacent to scutellar apex and oblique fuscus-margined whitish band across middle, band terminates near center of corium and touches large blackish or fuscus patch which covers most of costal area and at least half of corium.

Male genitalia: Genital capsule in lateral view (fig. 12) with projection on dorsal margin of pygofer; plate secondarily segmented in distal $\frac{1}{3}$; style hooked distally; long, oblique, simple paired processes from dorsal inner margin of pygofer directed toward rounded distal edge of pygofer; aedeagus slender, upturned, with short subapical process on proximal margin and longer process below 1st on distal margin. Aedeagus in posterior view (fig. 13) narrowed preapically, angularly expanded apically with gonopore terminal; distal paired processes simple and moderately long; proximal paired processes long and branched distally; apex of each branch expanded with distal edge finely dentate.

Female genitalia: Not characterized because of distortion in only available specimen.

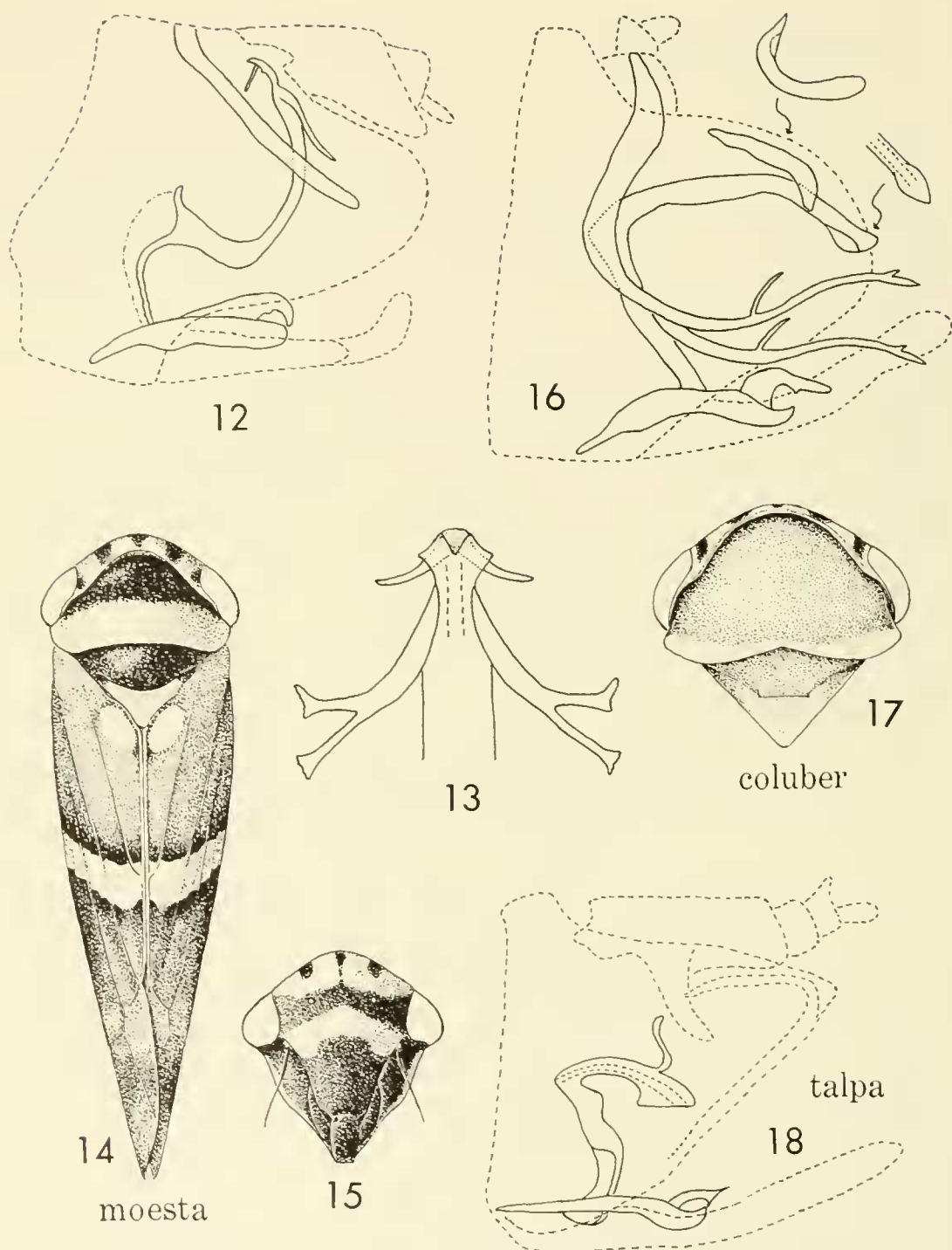


Fig. 12-15. *Agalliopsis moesta*. 12, Genital capsule in lateral view. 13, Aedeagal apex in posterior view. 14, Habitus. 15, Face. Fig. 16-17. *Agalliopsis coluber*. 16, Genital capsule in lateral view. 17, Head and thorax in dorsal view. Fig. 18. *Agalliopsis talpa*. Genital capsule in lateral view.

Type: Holotype male, Sinchono, Peru, November, 1943 in DeLong Collection at Ohio State University; additional female with same data in USNM.

Notes: The color pattern, unusually distinct for a species of *Agalli-*

opsis, and the male genitalia, particularly the aedeagus in posterior aspect, readily distinguish the species.

Agalliopsis coluber Kramer, new species

fig. 16-17

Length of male 4 mm, of female 4.2 mm.

Coloration: Entire venter, legs, and face pale brown; clypellus laterally and distally and patch under each eye fuscus to black; clypeal arcs faintly orange brown; weak, arched, brownish, mesally broken line below ocelli running width of face; edges of ocelli darkened; extreme apex of face with 3 angular black spots, central spot smaller and less regular. In dorsal view (fig. 17) crown with 5 black spots, central 3 extensions of those visible in facial aspect; hind margin of pronotum whitish, rest of pronotum varying from light orange brown to nearly mahogany, with anterior margin blackened narrowly in female and broadly in male, whitish hind margin of pronotum bordered anteriorly with black in male; scutellum unmarked; forewing hyaline and varying from light orange brown to nearly mahogany, unmarked except for whitish claval suture.

Male genitalia: Genital capsule in lateral view (fig. 16) with paired excessively long processes from 10th segment; processes slender, directed ventrally, and curved posteriorly, each process with simple branch on dorsal margin in distal $\frac{1}{3}$ and shorter branch on dorsal margin subapically; paired sclerites near dorsal inner margin of pygofer; style hooked distally; aedeagus slender, downcurved in distal $\frac{1}{3}$, gonopore ventral near apex.

Female genitalia: Pregenital sternum long with sides converging to form bluntly angular hind margin.

Types: Holotype male, Monson Valley, Tingo Maria, Peru, 2 November 1954, E. I. Schlinger and E. S. Ross in California Academy of Sciences; allotype female with same data in USNM.

Notes: The species is readily distinguished on the basis of color pattern and male genitalia. Even though the color pattern is the same in both sexes, the male is distinctly darker. This condition is not unusual in agalline leafhoppers.

Agalliopsis talpa Kramer, new species

fig. 18

Length of male 4 mm.

Coloration: Venter of abdomen and thorax fuscus to black; face and legs stramineous, only distinct markings at upper edge of face, center of extreme margin with narrow dark line and 1 black spot on each side. In dorsal view, crown stramineous with dark line at center and pair of spots on each side, central 3 markings extensions of those visible in facial view; pronotum, scutellum, and forewings fuscus to black, center of pronotum with pair of elongate pale areas on long axis; edge of scutellum pale in distal half; forewing with pale spot at middle of commissural margin and irregular pale patch at claval apex.

Male genitalia: Genital capsule in lateral view (fig. 18) with paired, ventrally

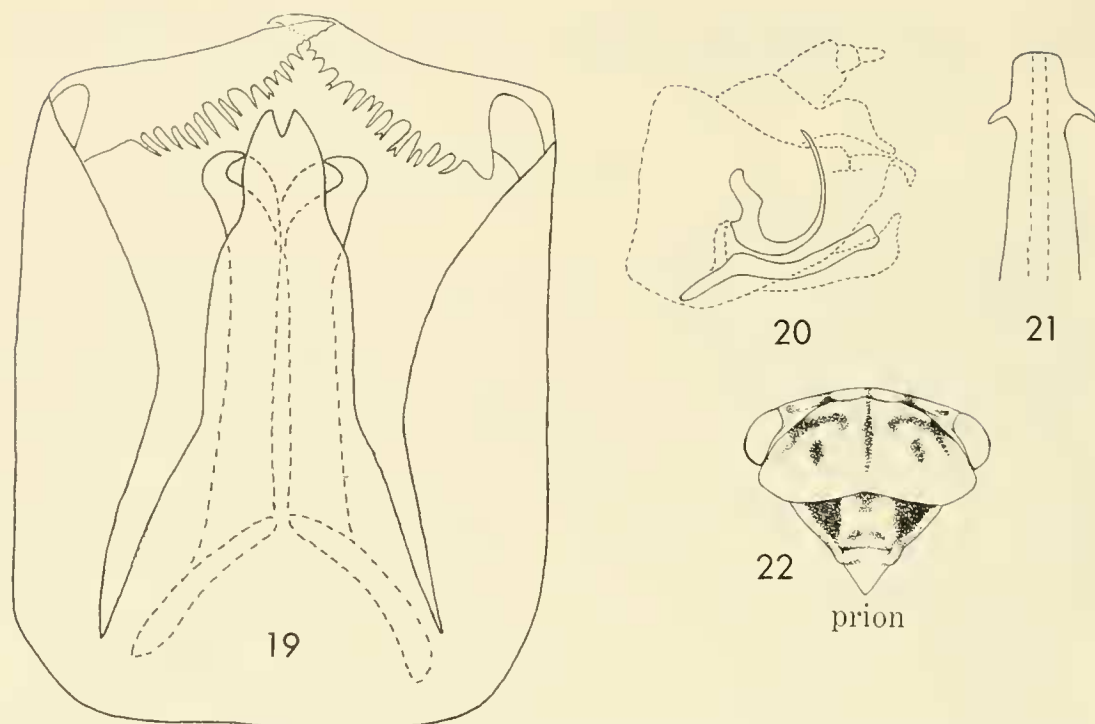


Fig. 19-22. *Euragallia prion*. 19, Genital capsule in ventral view. 20, Same in lateral view. 21, Aedeagal apex in posterior view. 22, Head and thorax in dorsal view.

projecting extensions from anal ring; inner edge of oblique hind margin of pygofer with paired thickenings which follow distal dorsal inner edge of pygofer; style hooked distally; aedeagus rather short, broadest distally, with distinct dorsal flap, gonopore ventral near apex. Not shown in fig. 18, long hairlike setae on dorsal margin of plate.

Type: Holotype male, Sinchono, Peru, DeLong Collection at Ohio State University.

Notes: The features of the male genitalia readily distinguish the species.

Euragallia prion Kramer, new species
fig. 19-22

Length of male 5.9-6.2 mm.

Structure: Contour of face irregular in upper half, with distinct pit near each eye on anterior margin.

Coloration: Venter of thorax and abdomen largely fuscus to black; sutures of thorax and distal edges of abdominal segments tawny; legs tawny and variably infuscated; face tawny and marked with black on all sutures, clypeal arcs, tip of clypellus, and antennal pits; narrow black arc below ocelli running width of face, black line from center of arc to extreme upper edge of face, black spot on upper margin on inner edge of each pit, moderately large irregular black patch between ocellus and eye, usually touching and partly surrounding ocellus. Head

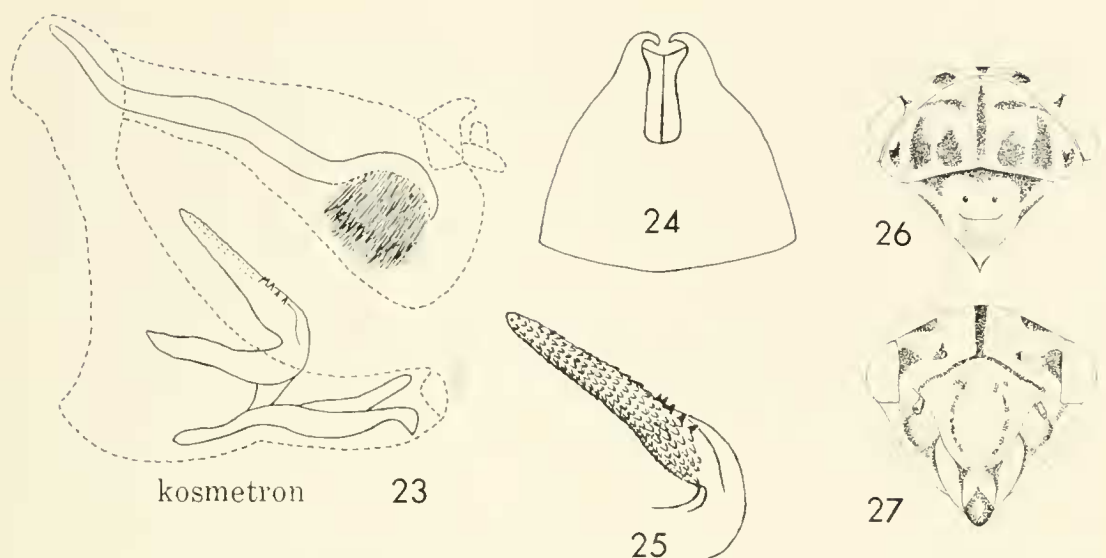


Fig. 23–27. *Agallia kosmetron*. 23, Genital capsule in lateral view. 24, Same in ventral view. 25, Detail of aedeagal shaft in lateral view. 26, Head and thorax in dorsal view. 27, Face.

and thorax in dorsal view (fig. 22) tawny and marked with black as indicated; forewing translucent tawny washed with fuscus, veins in distal half often infuscated or blackened, irregular blackish area at center of corium and sometimes between veins on commissural margin.

Male genitalia: Genital capsule in ventral view (fig. 19) with plates narrow and fused except at extreme apex; valve obsolete; distal edges of pygofer produced mesally as pair of large sawlike appendages. Genital capsule in lateral view (fig. 20) with 10th segment avicephaliform, dorsal distal margin of pygofer modified as illustrated; aedeagus simple, upturned, with distal portion thin, almost ribbonlike. Aedeagal apex in posterior view (fig. 21) with pair of short simple processes subapically; gonopore apical.

Types: Holotype male and paratype male Sinchono, Peru, in De-Long Collection at Ohio State University; one paratype male with same data in USNM.

Notes: The sawlike appendages of the male pygofer are unique in the genus and at once distinguish the species.

Agallia kosmetron Kramer, new species

fig. 23–27

Length of male 4.5 mm.

Structure: Crown slightly shorter at middle than next to eyes; pronotal surface finely granular.

Coloration: Thoracic venter and abdomen largely fuscus; legs pale brown and marked with fuscus or black; face yellowish brown and marked with fuscus to black as in fig. 27, inverted V-shaped marking on clypellus most distinctive. Crown, pronotum, and scutellum in dorsal view (fig. 26) yellowish brown and marked with fuscus to black as indicated; forewing sordid yellowish brown, veins

concolorous or slightly darker, some infuscation between veins, especially in basal half.

Male genitalia: Genital capsule in ventral view (fig. 24) with valve absent and plates reduced and fused. Genital capsule in lateral view (fig. 23) with pygofer greatly narrowed and 10th segment much enlarged and elongated; process of 10th segment long, slender, somewhat undulate, with brush of long hairlike setae distally on ventral margin, teeth concealed by setae; style forked distally; aedeagus more or less V-shaped with few teeth on distal submargin near base of shaft, gonopore slightly subapical on distal margin. Detail of aedeagal shaft in lateral view (fig. 25) shows most of surface covered with sharp scales.

Type: Holotype male (USNM 73278) La Florida, Peru, 6 May 1967, C. Korytkowski.

Notes: Externally, the highly modified male genital capsule at once separates this species from its congeners. The brushlike structure of the tenth segment and the scaly aedeagus provide additional highly distinctive characters.

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